I CLAIM:

1. A method of characterizing a semiconductor laser having at least first and second tuning sections controlled by respective first and second tuning currents, the method comprising:

    measuring power output from the laser as a function of the first and second tuning currents;

    creating an image of power as function of the two tuning currents;

    analyzing the image to determine different modes, each mode corresponding to limited ranges of the first and second tuning currents

    determining a preferred combination of the first and second tuning currents for each mode and defining an acceptable operating region for each mode.

2. A method as recited in claim 1, further comprising creating a first image of the power for one of the first and second tuning currents being swept in a first direction and a second image of the power for the one of the first and second tuning currents being swept in a second direction.

3. A method as recited in claim 1, wherein analyzing the image to determine different modes includes using both power and frequency information to determine positions of boundaries between modes.

4. A method as recited in claim 1, further comprising measuring frequency of light output from the laser as a function of the first and second tuning currents to produce frequency data, wherein analyzing the image to determine different modes includes using a watershed technique based on power information and includes using the frequency data obtained from measuring the frequency of the light output from the laser.

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5.   A method as recited in claim 4, wherein measuring the frequency of the light includes measuring power of the light transmitted through a filter having a known frequency response.

6.   A method as recited in claim 5, further comprising measuring power of light reflected by the filter.

7.   A method as recited in claim 1, wherein defining an acceptable operating region for each mode includes calculating slopes of principal axes of the mode and fitting an ellipse within the mode, the ellipse having the principal axes.

8.   A method as recited in claim 7, wherein calculating slopes of principal axes includes calculating elements of moments of inertia for the mode and calculating the slopes of the principal axes from the elements of moment of inertia.

9.   A method as recited in claim 7, wherein fitting the ellipse within the mode includes determining whether a portion of the mode is subject to hysteresis in one of the tuning currents and fitting the ellipse to avoid hysteretical areas of the mode.

10.   A method as recited in claim 1, further comprising measuring side mode suppression ratio and selecting an operating point within a mode that corresponds to maximum side mode suppression ratio.

11.   A method as recited in claim 1, further comprising measuring a threshold power of the laser for each mode.

12.   A method as recited in claim 1, wherein analyzing the image includes reducing a frequency gradient within the image.

13.   A method as recited in claim 12, wherein reducing the frequency gradient within the image includes calculating a pseudo-gaussian kernel, calculating a derivative kernal from the pseudo-gaussian kernel, convolving the pseudo-gaussian kernal with the derivative kernel to produce an operator kernel, and convolving a frequency image the operator kernel.

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